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Comprehensive Energy Plan: Electric Grid and Utility Issues

Stakeholder Meeting

June, 2015

Presentation Overview

- Current Statutes
- Electricity's role in meeting Energy Use Reduction and Renewable Energy goals
  - Informed by Total Energy Study modeling
- Overview of small group discussion questions

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State energy policy: 30 V.S.A. §202(a)

- To assure, to the greatest extent practicable, that Vermont can meet its energy service needs in a manner that is adequate, reliable, secure and sustainable; that assures affordability and encourages the state's economic vitality, the efficient use of energy resources and cost effective demand side management; and that is environmentally sound.

- (2) To identify and evaluate on an ongoing basis, resources that will meet Vermont's energy service needs in accordance with the principles of least cost integrated planning; including efficiency, conservation and load management alternatives, wise use of renewable resources and environmentally sound energy supply.

Electric planning – 30 V.S.A §218c

- A "least cost integrated plan" for a regulated electric or gas utility is a plan for meeting the public's need for energy services, after safety concerns are addressed, at the lowest present value life cycle cost, including environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission, and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs.

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Other statutes

- §218d: Alternative regulation
- §218e: Manufacturing
- §219a and §8010: Net metering
- §8001 and §8005: Renewable energy goals

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Renewable Energy Standard (H.40)

- Tier 1: Overall renewable (import or in-state)
- Tier 2: ~5x increase from current level of in-state distributed generation (much of which will come in the next 18 months)
- Tier 3: Credit for reducing fossil fuel use, through efficiency, fuel shifting, or both. Expected to drive increased electrification, with a responsibility to manage peak loads and work within existing grid infrastructure.

Energy Use Reduction Goal?

- The 2015 CEP could establish a goal of reducing total energy consumption by ~33% or more by 2050, from our current level.
- Accomplished through increased efficiency in energy production and use.
- For context, Vermont's total energy consumption has declined about 7% from a peak in 2004.

Two Types of Energy Efficiency

- Expending less energy to perform the same end use services
  - Also includes switching to new fuels/technologies that are fundamentally more efficient (e.g. EVs, heat pumps)
- More efficient production
  - Avoid the lost heat that comes from combustion and conversion to electricity

Electricity's role in 2025 sector goals

- Electric supply: ~2/3 renewable by 2025 from the RES (H.40)
- Buildings: 35% renewable overall and 30% renewable heat could look like this…

1) Maintain current electric use level for purposes other than heat while the number and total size of buildings grow.
2) Use 35,000 cold-climate heat pumps (using an assumption that each displaces the equivalent of 350-400 gallons of heating oil per year).

- Transportation: 10% renewable could mean 50,000 to 80,000 EVs (depending on ethanol use)

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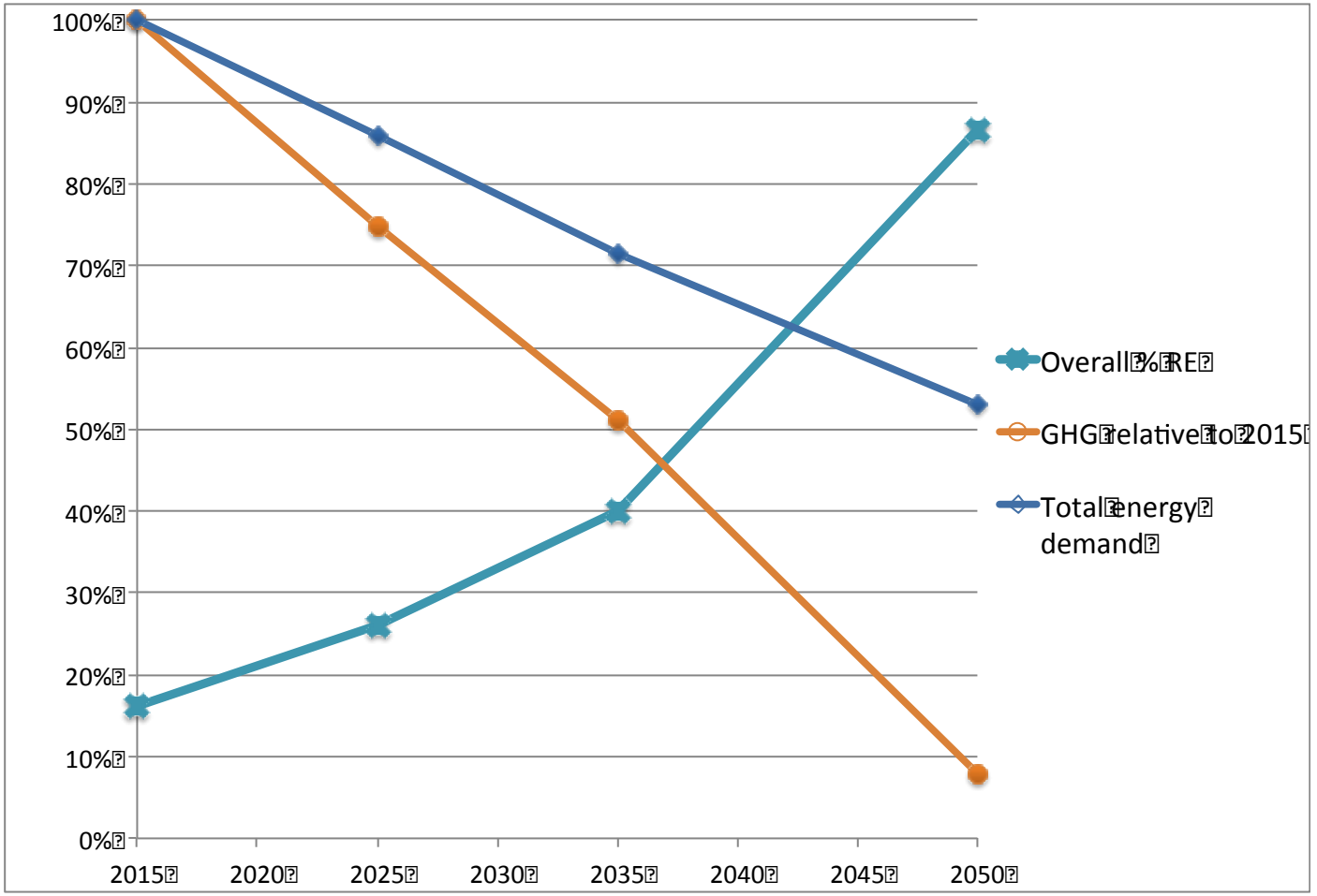
TES-based Renewable % and GHG



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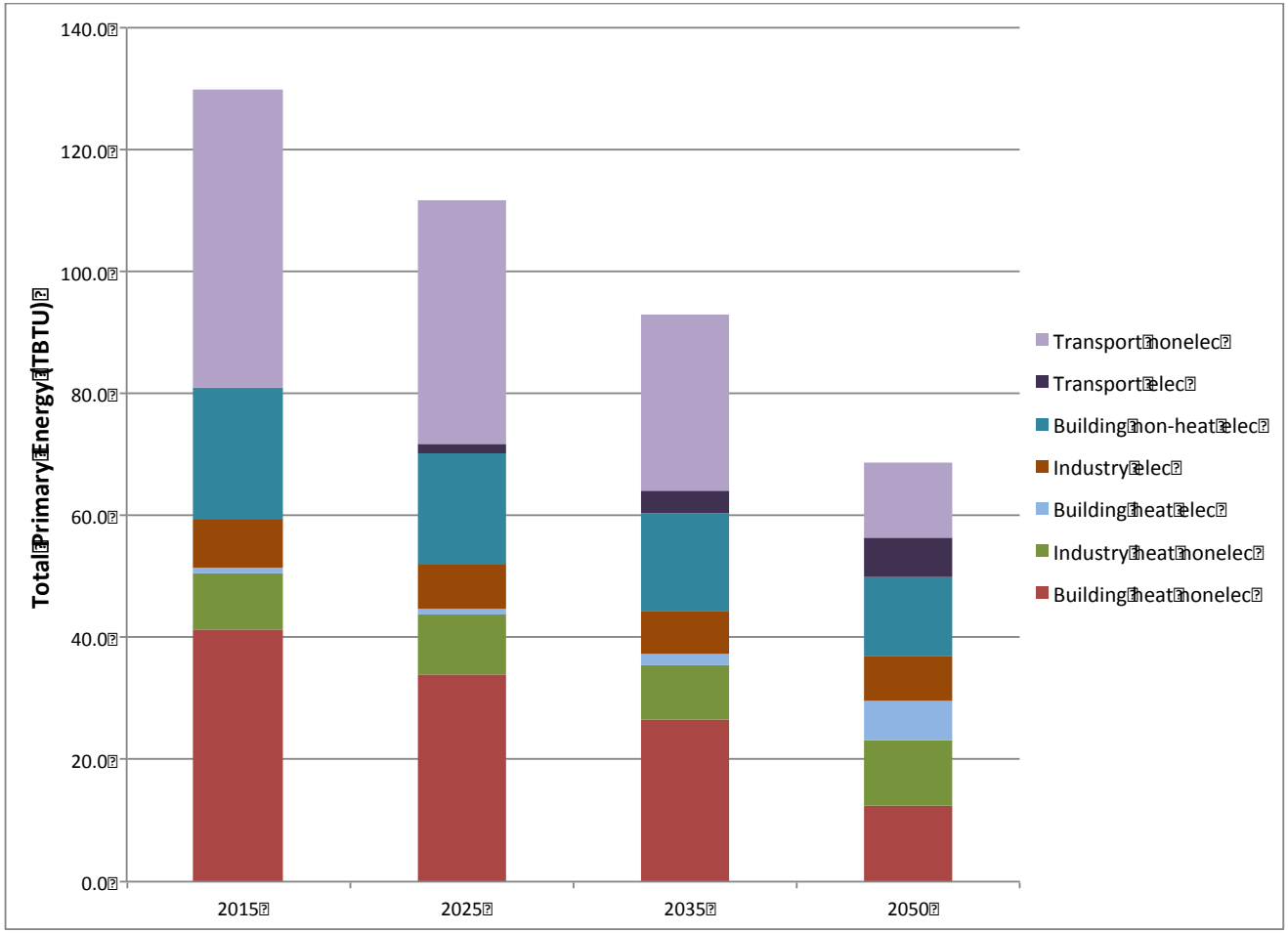
TES-based total primary energy



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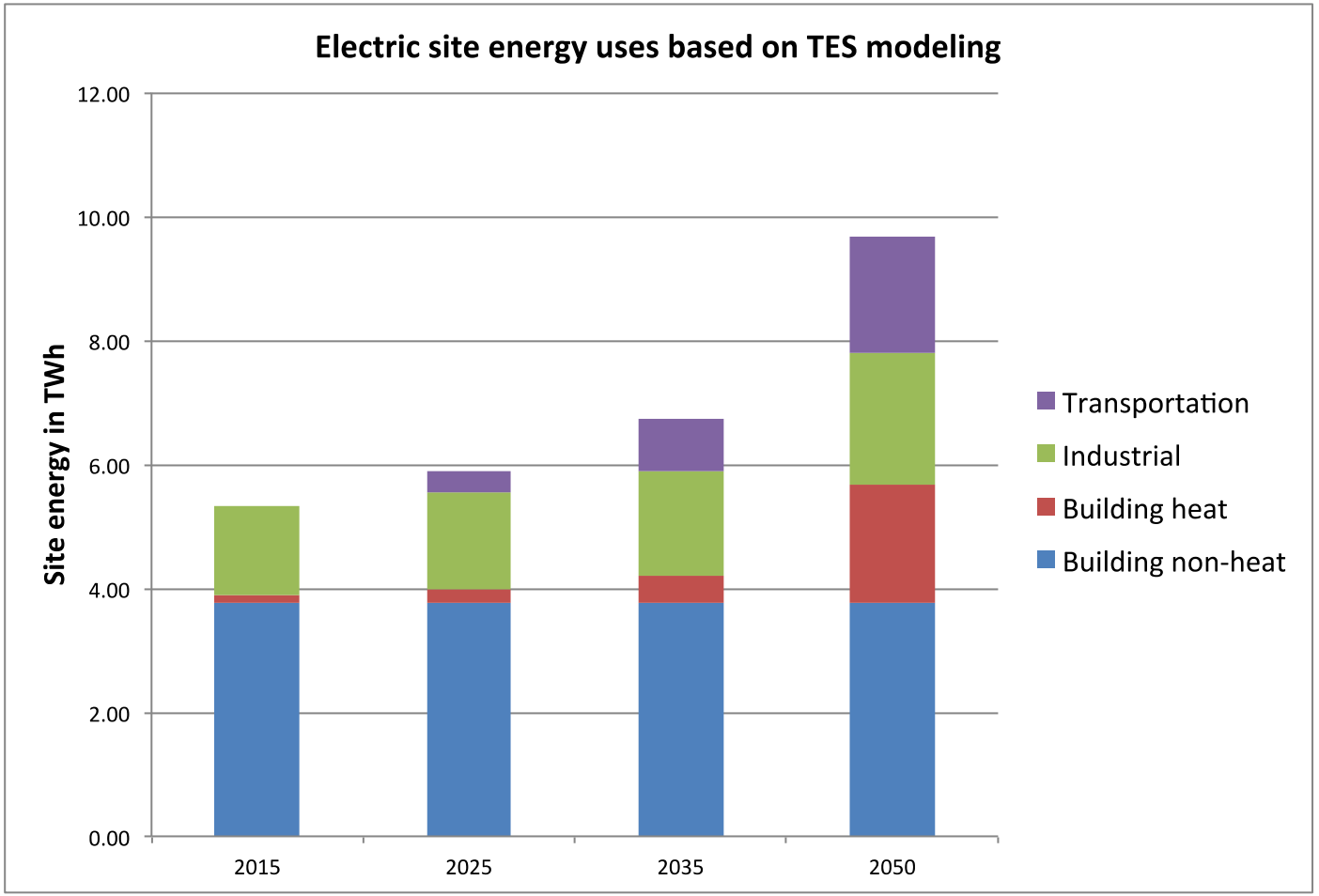
TES-based electric site energy



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Next: Small group discussions

- Facing this transition, how should state policy, including regulation, adapt?
- What are the biggest challenges facing Vermont electric ratepayers and utilities in the next 5-10 years? 20-35 years?
- Three perspectives:
  - Customer
  - Regulation/policy
  - Infrastructure
- Feel free to wander between perspectives, but each group will start with one set of questions

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Customer

- How can electric rate designs for consumers of all classes best advance state energy and economic goals?
- How important are power quality and other power characteristics, balanced against cost?
- How important is customer ownership and direct participation in the electric system (e.g. via behind-the-meter resources used for the grid)?
- How much should the electric plan rely on consumers embracing utility load control or appliances/vehicles/machinery that respond to dynamic prices?

Regulation/policy

- What is the right role for franchised electric utilities in advancing a transformed energy system?
- Does Vermont's current utility regulatory structure support or inhibit utilities from pursuing the societally least-cost energy system?
- How should Vermont's electric plan reflect the different ownership structures of VT utilities (IOU, muni, coop) and their different sizes?
- What regulatory or policy tools do regulators and other policy-makers need to drive the right set of actions?

Infrastructure

- Are there “no regrets” or “few regrets” grid upgrades or other changes Vermont utilities should consider making soon to enable future grid transition, which would also provide some kinds of value today?
- Should Vermont strengthen or expand its electrical connections to neighboring states/provinces? Why or why not?
- What will limit the integration of distributed energy resources into Vermont’s grid?
- What role should electric energy storage play on the grid? Who should deploy it, and how should they be compensated? What difference should there be between stand-alone storage and EV batteries?